Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method for inspection of flat patterned media comprising:

detecting [[for]] a first defect[[s]] of the flat patterned media through an imaging means using a relatively lower resolution imaging and positioning protocol; ~~while concurrently~~

detecting a second defect of the flat patterned media using the relatively lower resolution imaging and positioning protocol; and

reviewing, using imaging according to a relatively higher resolution imaging and positioning protocol, the first defects ~~which have been noted by said detecting step~~, wherein the reviewing of the first defect is performed concurrently with detecting of the second defect.

2. (Original) The method according to claim 1 wherein said reviewing step uses dynamically-optimized on-the-fly, automatic focus imaging.

3. (Currently amended) A method for detection of defects, concurrent with on-the-fly review and classification of defect candidates in a flat patterned object under test comprising the following parallel operations:

acquiring images of the object;

detecting a first defect ~~candidates~~ of said object; [[and]]

assigning review worthiness values to said first defect ~~candidates,~~ through a defect detection sub-system having a plurality of defect detection sub-system modules operative according to a first relatively lower operating resolution;

detecting a second defect of said object and assigning review worthiness values to said second defect ~~all while concurrently~~

acquiring images of smaller areas around said first defect ~~candidates,;,~~ reviewing said ~~smaller areas~~ first defect, and classifying said ~~smaller areas~~ first defect through a defect review sub-system having a plurality of defect review sub-system modules operative according to a second relatively higher resolution, wherein the detection of said second defect is performed concurrently with the review of the first defect.

4. (Currently amended) The method according to claim 3 further comprising:

maximizing [[the]] a number of higher priority defect candidates captured by said defect review sub-system modules and minimizing distance traveled by said defect review sub-system modules using a dynamic defect review sub-system module dispatching algorithm for optimizing motion in said concurrent higher resolution reviewing.

5. (Currently amended) The method according to claim 4 wherein said dispatching algorithm further comprises:

constructing, for each defect review sub-system and at each iteration of said motion optimization, a forward feasible motion graph in a Graph Theory sense with nodes corresponding to each defect candidate and current position of its associated module, and with arcs corresponding to feasible motions in between said nodes;

associating costs for each said arc signifying a module movement from the [[a]] first ~~one of said~~ defect ~~candidates~~ to the [[a]] second ~~one of said~~ defect ~~candidates,~~ according to a suitable cost function selected from functions representing the cost of missing other defects, distance of required motion and review worthiness of a target defect candidate, and thereby obtaining a resulting graph;

solving the resulting graph for finding a minimum cost path, represented by an ordered sequence of defect to defect transitions, from the current location of the defect review sub-system module to the end of a window considered along scanning direction; and

computing motion data for the defect review sub-system module for controlling motion of the defect review sub-system module.

6. (Currently amended) The method according to claim 3 further comprising:

beginning at a pre-determined distance from a target candidate location, and during the motion of the defect review sub-system module, automatically focusing the imaging element ;

obtaining a focus quality metric curve using at least samples of a focus quality metric computed over the images;

interpolating the samples of the focus quality metric curve with a smoothing function to determine a maximizing focus point for a z-stage used for moving the focusing optics; and

directing the z-stage to [[a]] the z-axis position which maximizes the said focus quality metric curve to achieve sharpest focus of the target candidate location.

7. (Original) The method according to claim 6 wherein said focusing step includes:

capturing a sequence of image data from an imaging element of the defect review sub-system; and wherein said obtaining step comprises

using a sequence of image data in combination with said focus quality measure computed over the images to sample the focus quality curve.

8. (Original) The method according to claim 3 comprising:

generating in the defect detection sub-system, a sequence of defect candidates;

queuing and scheduling the sequence for imaging by a plurality of the defect review sub-system modules;

dispatching the defect review sub-system modules to perform relatively higher resolution imaging of outstanding defect candidates to create a sequence of defect candidates associated with the relatively higher resolution image data;

causing the defect candidates to experience a two stage processing involving:

an automatic review process; and

an automatic classification process;

during the automatic review process, comparing the high resolution candidate image with a reference image stored in system memory of known defect status, wherein the comparing comprises compensating for known variations between test and reference including correcting for at least one of the following:

a) imaging instrument sensitivities, and

b) sensor pixel sensitivity variations;

compensating for spatial misalignment at sensor pixel level to result in either the validation of the existence of a legitimate defect at the candidate location or rejection of the defect as a false defect, including an artifact of known limitations of the low resolution DDS;

conveying information on legitimate defects to for automatic classification processing; thereafter

during automatic classification processing, using the relatively higher resolution defect image in combination with output of the automatic classification processing to extract relevant features of the defect; and

making a final decision on type of the defect through the classification processing.

9. (Currently amended) An apparatus for flat patterned media inspection comprising:

a detection sub-system for detecting a first defect ~~candidates~~ through an imaging means using a relatively lower resolution imaging and positioning protocol; and

a review sub-system operative to ~~concurrently~~ review [[for]] the first defect[[s]] ~~noted by said detection sub-system~~ using a relatively higher resolution imaging and positioning protocol wherein said review sub-system is operative to review the first defect concurrently while the detection sub-system operates to detect a second defect.

10. (Currently amended) The apparatus according to claim 9 wherein said detection sub-system is further operative to assign review worthiness values to said first and second defects ~~candidates~~.

11. (Currently amended) An apparatus for defect detection, concurrent on-the-fly defect review and classification of phenomena in an object under test, said apparatus comprising:

a defect detection sub-system having a plurality of defect detection sub-system modules for acquiring images of the object, for detecting defect candidates and for assigning review worthiness values to said defect candidates according to a first relatively lower operating resolution; and

a defect review sub-system having a plurality of defect review sub-system modules operative to ~~concurrently~~ acquire images of a smaller area around the defect candidates, for reviewing said defect candidates and for classifying said defect candidates as defects using a relatively higher resolution, wherein said defect review subsystem reviews a first one of said defect candidates while said defect detection subsystem detects a second one of said defect candidates.

12. (Previously presented) The apparatus according to claim 11 wherein the defect detection sub-system is mounted on a first moveable gantry and the defect review sub-system is mounted on a second moveable gantry, said first and second moveable gantries adapted to move along a same direction.

13. (Previously presented) The apparatus according to claim 11 wherein the defect detection sub-system comprises a plurality of detection modules fixedly mounted on a first moveable gantry and the defect review sub-system comprises a plurality of defect review sub-system modules mounted for motion along on a second moveable gantry, said first and second moveable gantries adapted to move along a same direction.

14. (Original) The apparatus according to claim 13 wherein motion of first ones of said review modules is limited by position of second ones of said review modules and further including a controller operative to:

construct a forward flow graph with nodes corresponding to defect candidates and current position of one of the defect review sub-system modules, and with arcs corresponding to

feasible motions from the current position for the defect review sub-system module to first selected defect candidates and in between second selected defect candidates;

for each arc signifying a module move from one defect candidate to another defect candidate, associate costs to arcs as a function of cost factors, including a cost of missing other defects, distance of necessary motion, and worthiness of a captured defect to obtain a resulting graph;

solve the resulting graph for minimum cost path from the current location of the defect review sub-system module to an end of a y-axis window considered; and

compute motion data for the defect review sub-system module for controlling motion of the defect review sub-system module.